

What is Claimed is:

1. A conductive damascene structure formed by filling copper in a plug portion formed on an insulating film, the plug portion having a copper barrier layer formed to reach a depth of 3 nm to 50 nm from the surface of side wall portions and plane portions defining an inner wall of the plug portion, and having copper filled in the plug portion.

2. A conductive damascene structure formed by filling copper in a plug portion formed on an insulating film, the plug portion having on its inner wall a two-step trench portion comprising a large cross-section and a small cross-section via a plane portion, the plug portion having a copper barrier layer formed to reach a depth of 3 nm to 50 nm from the surface of side wall portions and plane portions defining the inner wall of the plug portion, and having copper filled in the plug portion.

3. A sample having a conductive damascene structure formed thereto by filling copper in a plug portion formed on an insulating film, the plug portion having a width of 0.1 μm or smaller with a copper barrier layer formed to reach a depth of 3 nm to 50 nm from the surface of its side wall portions and plane portions defining an inner wall of the plug portion, and having copper filled in the plug portion provided with the barrier layer.

4. A sample having a conductive damascene structure formed thereto by filling copper in a plug portion formed on an insulating film, the plug portion having a width of 0.1 μm or smaller with a copper barrier layer formed to

reach a depth of 5 nm to 30 nm from the surface of its side wall portions and plane portions defining an inner wall of the plug portion, and having copper filled in the plug portion provided with the barrier layer.